

Left and right foramen of Monro

Support for Creation of an ICD-9 Code for Normal Pressure Hydrocephalus (NPH)

Michael A. Williams, M.D.

Adult Hydrocephalus Program

Departments of Neurology and Neurosurgery

Johns Hopkins Hospital

Baltimore, MD



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Disclosure

- ▲ In the last 12 months:
 - ▲ Our program received research support from Medtronic
 - ▲ I have received honoraria from Medtronic
 - ▲ I am on Codman's NPH Advisory Panel
- ▲ The content of this presentation is intended to be independent and free from commercial bias.
- ▲ My affiliations are shown for the purpose of identification. I am not representing the views of the Johns Hopkins Medical Institutions.



A resource for patients and families



www.hydroassoc.org

888-598-3789

Biannual Meeting

May 26-29, 2006

Hyatt Regency Hotel

Baltimore, MD

Disclosure: I serve on their Medical Advisory Board as a volunteer

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Definition and ICD-9 Coding of Adult Hydrocephalus

- ▲ Ventricular enlargement due to altered CSF flow or resorption, with or without symptoms or neurologic impairment
- ▲ Obstructive Hydrocephalus (331.4)
 - ▲ Impairment of CSF flow within the ventricular system
- ▲ Communicating Hydrocephalus (331.3)
 - ▲ Impairment of CSF flow or resorption outside the ventricular system
 - ▲ Impaired flow through the subarachnoid space
 - ▲ Impaired resorption at the arachnoid granulations

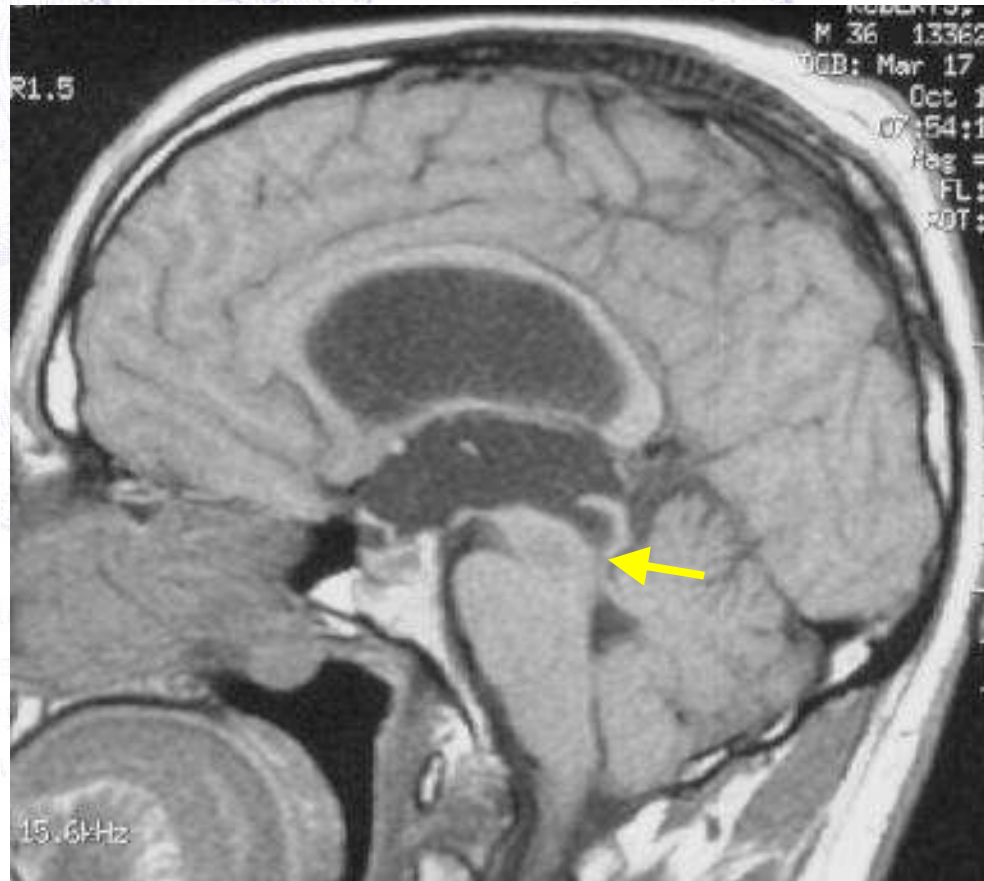


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Obstructive Hydrocephalus: Aqueductal Stenosis (331.4)

- ▶ 36-yo man with headaches, syncope, job impairment

Cisterna chiasmatis
Cisterna interpeduncularis
Descending horn of lateral ventricle
Cisterna pontis
Aqueduct of S
Right and left foramen



Communicating Hydrocephalus (331.3)

▲ Idiopathic

- ▲ In the elderly, normal pressure hydrocephalus
- ▲ Chronic, insidious onset

▲ Symptomatic (secondary) hydrocephalus

- ▲ Post-subarachnoid hemorrhage (aneurysm), post-infectious, post-traumatic
- ▲ Acute, subacute or chronic onset



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Normal Pressure Hydrocephalus

- ▶ NPH is a treatable form of dementia, gait apraxia and urinary incontinence
- ▶ Treatment is surgical--shunt insertion
- ▶ Treatable nature of NPH distinguishes it from the essentially untreatable nature of most dementias
- ▶ Common diagnostic tests do not predict the outcome from shunt surgery very well



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NPH Diagnosis

- ▲ NPH clinically overlaps with many conditions of the elderly
 - ▲ Vascular dementia
 - ▲ Degenerative dementias or disease
 - ▲ Cervical stenosis/myelopathy
 - ▲ Lumbar stenosis
 - ▲ Peripheral neuropathy

Cisterna interpeduncularis

Recess

Cisterna pontis

Right and Left Foramen of Luschka

Foramen of Magendie

Cisterna magna (cerebello-medullaris)



Left and right foramen of Monro

Consensus Guidelines

- ▶ Supplement to Neurosurgery September 2005
- ▶ Important contribution to the literature
- ▶ Identifies existing knowledge and gives good, practical advice
- ▶ Identifies significant gaps in our knowledge

Cisterna interpeduncularis

Third ventricle

Aqueduct of Sylvius

Foramen of Luschka

Foramen of Magendie

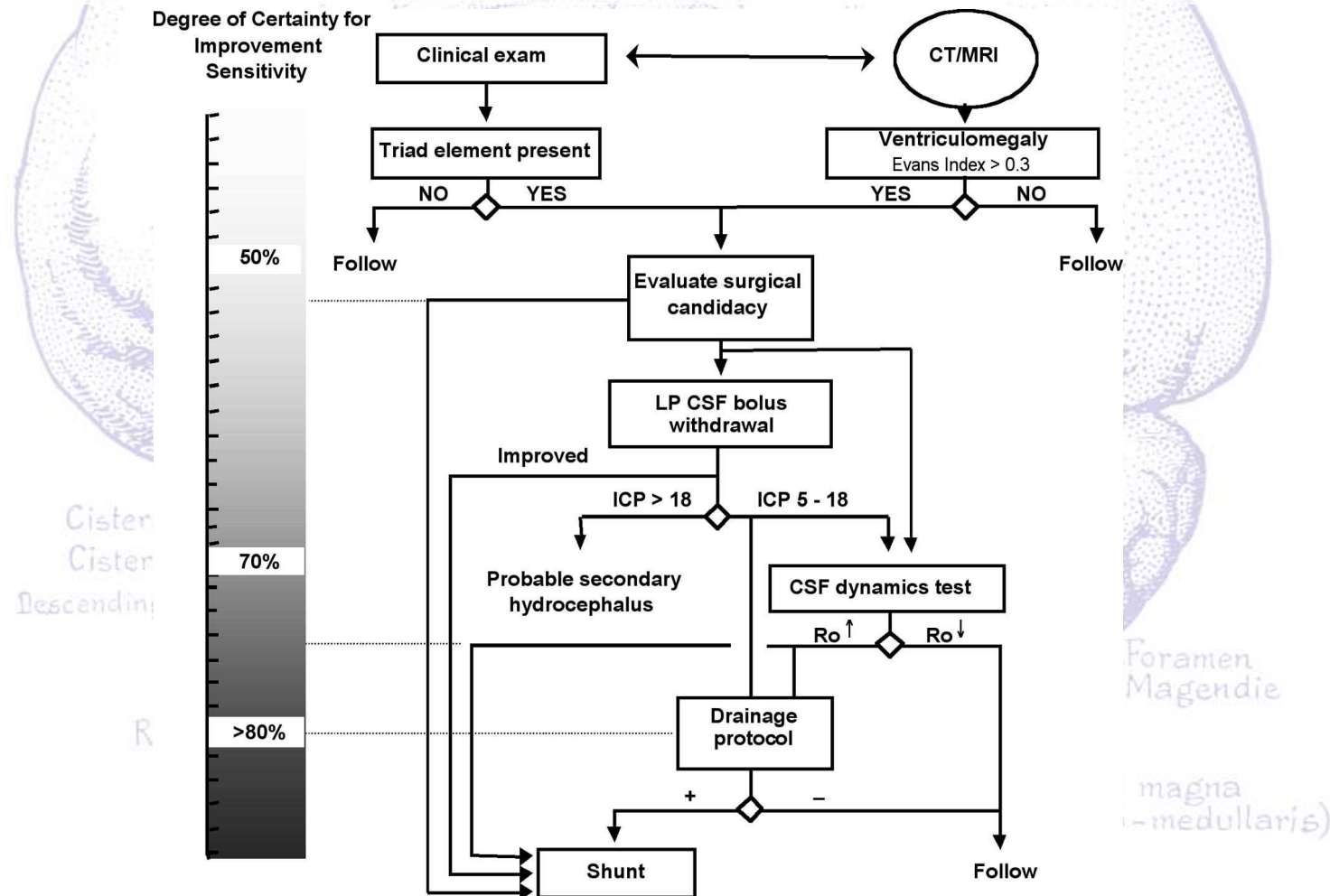
Cisterna magna
(cerebello-medullaris)



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INPH Guidelines Diagnostic Algorithm

Neurosurgery 2005:57:S2-17-S2-28



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Treatment results in meaningful improvement in NPH

- ▲ Gait and incontinence improve
 - ▲ As shown by MCV and Hopkins studies
- ▲ Dementia improves
 - ▲ While some debate in the literature
 - ▲ We have published 3 papers showing significant overall cognitive improvement
 - ▲ Defined as a 4-point improvement in MMSE, or improvement by 1 SD in 50% of the administered neurocognitive subtests, compared to the baseline

Cisterna interpeduncularis

Des

Cisterna magna

Cisterna magna (cerebello-medullaris)



NPH Cognitive Improvement Surpasses AD Improvement

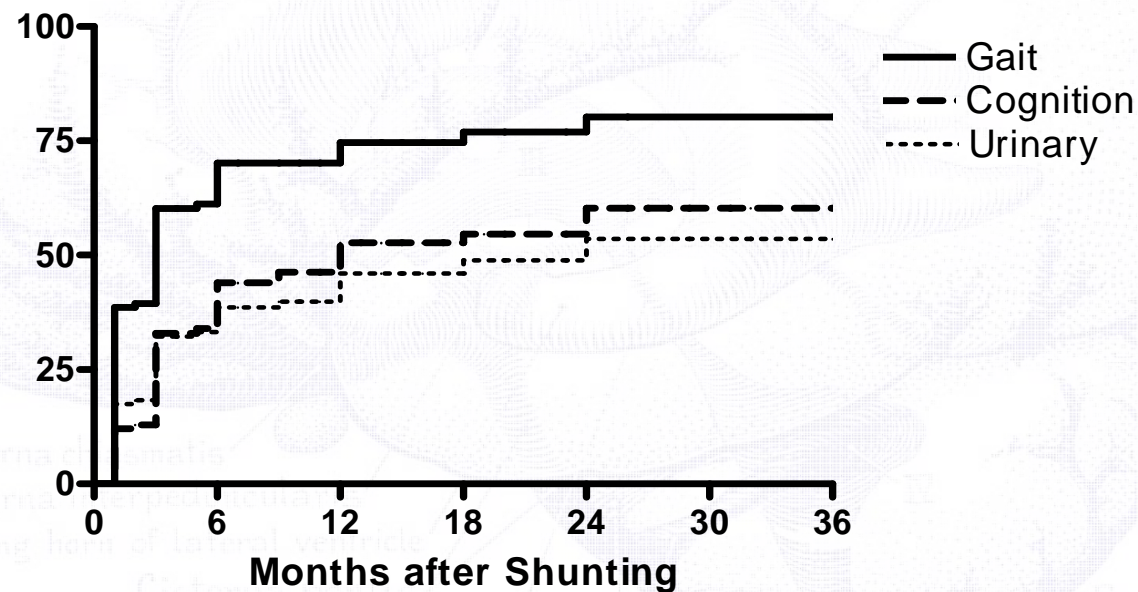
- ▲ “Our finding of over 50% of INPH patients with significant overall cognitive improvement 3 months after shunt insertion may be an underestimation, as long-term improvement at 6–12 months has been reported in more than 60% of INPH patients. On the other hand, drug trials in AD patients with acetylcholinesterase inhibitors did not demonstrate a significant difference between baseline and 3- to 6-month posttreatment scores, and less than half the patients achieved a clinically significant response.”

Dement Geriatr Cogn Disord 2005;20:163–168



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Outcome of 132 Pts with Idiopathic NPH



McGirt MJ, Coon AL, Thomas G, Woodworth G, Williams MA, Rigamonti D. Diagnosis, treatment and analysis of long-term outcomes in idiopathic normal pressure hydrocephalus. *Neurosurgery* 2005;57:699-705.



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The problem with 331.3

- ▶ There is a wide spectrum of clinical presentation for “communicating hydrocephalus” coded as 331.3
- ▶ It includes critically ill patients in the ICU with hydrocephalus from subarachnoid hemorrhage, for example, as well as patients with NPH

Right and Left Foramen of Luschka

Foramen of Magendie

Cisterna magna (cerebello-medullaris)



Left and right foramen of Monro

Post SAH Early Hydrocephalus (331.3)



Cisterna ch
Cisterna in
Descending hor

Right

Foramen
of Magendie

rna magna
ello-medullaris)



Left and right foramen of Monro

Post SAH Delayed Hydrocephalus (331.3)



Cisterna chiasmata
Cisterna interpeduncularis
Descending horn of lateral ventricle
Cisterna magna
Aquaeductus cerebri
Right and left

Foramen of Magendie

Cisterna magna (cerebello-medullaris)



Left and right foramen of Monro

So why is that a problem?

- ▶ Our ability to use databases dependent on ICD-9 codes to understand many different aspects and outcomes of a clinically distinct, treatable form of hydrocephalus is impaired
- ▶ We used the Medicare SAF to investigate costs of diagnosing and treating NPH

Right and Left foramen of Luschka

Cisterna magna
(cerebello-medullaris)



Left and right foramen of Monro

Health Care Expenditures in 331.3

Methods

- ▶ Retrospective cost analysis using the Standard Analytic Files of paid claims for beneficiaries enrolled in both Parts A and B Medicare for 1997 through 2001 (Index year 1999).
- ▶ A 5% sample of the SAF yielded a total of 1441 beneficiaries with a diagnosis code 331.3, including 362 (25.1%) who received a first shunt and 1079 who did not.

Right and Left foramen of Luschka

Cisterna magna
(cerebello-medullaris)

Foramen
of Magendie



Left and right foramen of Monro

Health Care Expenditures in 331.3 Results

- ▶ The effect of a shunt procedure on 5-year Medicare expenditures is a cost reduction of \$25,477 ($p < .0001$) per patient
- ▶ Potential \$184.3 million reduction in 5-year Medicare expenditures
- ▶ After factoring in shunt complications (17.4% of pts) there was still a \$157 million reduction in 5-year Medicare expenditures

Right and Left foramen of Luschka

foramen
of Magendie

Cisterna magna
(cerebello-medullaris)



BUT

- ▶ We cannot identify how many of these patients had NPH and how many had other forms of 331.3
- ▶ What about the 75% of 331.3 who were never treated?
- ▶ In light of the aging population, the number of pts with NPH will rise, and so will health care expenditures if they are not identified or treated
- ▶ A unique ICD-9 code for NPH will enable us to follow the epidemiology, outcomes, and financial impact of this important disorder



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Summary

- ▶ Normal pressure hydrocephalus is a distinct clinical entity, and patients have significant improvement with treatment
- ▶ A new ICD-9 code, 331.5, will benefit patients and the population by improving diagnostic accuracy
- ▶ On behalf of myself and the Medical Advisory Board of the Hydrocephalus Association, I support the creation of 331.5 for NPH



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Normal Pressure Hydrocephalus



Cisterna chiasmatis
Cisterna interpeduncularis
Descending horn of lateral ventricle
Cisterna magna
Aqueduct of midbrain
Right and left foramen of Monro

Foramen of Magendie

Cisterna magna (cerebello-medullaris)



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Thank you

